

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1-88. (canceled)

89. (new) A method of modulating in a cantharanthus plant cell the expression of one or more genes involved in the biosynthesis of a terpenoid indole alkaloid (TIA) or a precursor therefore, said method comprising the steps of:

a) transforming the cell with a genetic construct comprising a nucleotide sequence encoding an AP2-domain transcription factor, operably linked to an expression regulating sequence that is operable in said cell; and,

b) cultivating said cell under conditions such that the nucleotide sequence is expressed in said cell;

wherein said nucleotide sequence encodes an AP2-domain transcription factor selected from the group consisting of

i) a transcription factor comprising the amino acid sequence of SEQ ID NO: 6;

ii) a transcription factor comprising amino acids 68-179 of SEQ ID NO: 6; and

iii) a transcription factor having an amino acid sequence with at least 90% amino acid sequence identity with an

amino acid sequence as defined in i) or ii), wherein the transcription factor enhances the biosynthesis in *Cantharanthus roseus* cells of at least one of tryptophane or tryptamine by at least 10%, when stably expressed in said *C. roseus* cells from a genetic construct comprising a sequence coding for the transcription factor operably linked to a 2B4A1 plant promoter.

90. (new) The method according to claim 89, wherein the expression regulating sequence is heterologous to the cell and/or in which the expression regulating sequence is an expression regulating sequence with which the nucleotide sequence that encodes the AP2-domain transcription factor is not natively associated.

91. (new) The method according to claim 89, wherein the plant cell is *Cantharanthus roseus*.

92. (new) The method according to claim 89, wherein the TIA is selected from the group consisting of serpentine, ajmalicine, vincristine, vinblastine, camptothecine, quinine, quinidine, reserpine, strictosidine, rescinnamine, ellipticine and precursors and/or intermediates therefore.

93. (new) The method according to claim 89, wherein the gene involved in the biosynthesis of the TIA encodes a protein or polypeptide, including but not limited to an enzyme.

94. (new) The method according to claim 93, wherein the enzymes are selected from the group consisting of Tdc, Str, Cpr, D4h, Asa and Dxs.

95. (new) An isolated nucleic acid molecule comprising a nucleotide sequence selected from:

- a) SEQ ID NO: 3; and,
- b) a nucleotide sequence encoding an AP2-domain transcription factor selected from the group consisting of
  - i) a transcription factor having the amino acid sequence of SEQ ID NO: 6.
  - ii) a transcription factor having an amino acid sequence that comprises at least amino acids 68-179 of SEQ ID NO: 6; and
  - iii) a transcription factor having an amino acid sequence with at least 90% amino acid sequence identity with an amino acid sequence as defined in i) or ii), wherein the transcription factor when stably expressed in a *Cantharanthus roseus* cell from a genetic construct comprising a sequence coding for the transcription factor operably linked to a 2B4A1 plant promoter, enhances the biosynthesis in said *C. roseus* cell of at

least one of tryptophane or tryptamine by at least 10%.

96. (new) The isolated nucleic acid molecule according to claim 95, wherein said sequence comprises SEQ ID NO: 3.

97. (new) The method according to claim 89, wherein said plant cell is from a plant selected from the group of species consisting of *C. roseus*, *C. coriaceus*, *C. lanceus*, *C. longifolius*, *C. ovalis*, *C. pusillus*, *S. scitulus* and *C. tricholphyllus*; and wherein said TIA is selected from the group consisting of serpentine, ajmalicine, vincristine, vinblastine, camptothecine, quinine, quinidine, reserpine, strictosidine, rescinnamine, ellipticine and precursors and/or intermediates therefore.

98. (new) A method of modulating in a *Cantharanthus roseus* plant cell the level(s) of AP2-domain transcription factor, said method comprising the steps of:

a) transforming the cell with a genetic construct comprising a nucleotide sequence encoding an AP2-domain transcription factor, operably linked to an expression regulating sequence that is operable in said cell; and,

b) cultivating said cell under conditions such that the level of AP2-domain transcription factor is expressed in said

cell;

wherein said nucleotide sequence encodes an AP2-domain transcription factor selected from the group consisting of

i) a transcription factor comprising the amino acid sequence of SEQ ID NO: 6.

ii) a transcription factor comprising amino acids 68-179 of SEQ ID NO: 6; and

iii) a transcription factor having an amino acid sequence with at least 90% amino acid sequence identity with an amino acid sequence as defined in i) or ii), wherein the transcription factor enhances the biosynthesis in *Cantharanthus roseus* cells of at least one of tryptophane or tryptamine by at least 10%, when stably expressed in said *C. roseus* cells from a genetic construct comprising a sequence coding for the transcription factor operably linked to a 2B4A1 plant promoter.

99. (new) A method of increasing in a *Cantharanthus* plant cell the expression of one or more genes involved in the biosynthesis of tryptophane or tryptamine, said method comprising the steps of:

a) transforming the cell with a genetic construct comprising a nucleotide sequence encoding an AP2-domain transcription factor, operably linked to an expression regulating sequence that is operable in said cell; and,

b) cultivating said cell under conditions such that the

nucleotide sequence is expressed in said cell;

wherein said nucleotide sequence encodes an AP2-domain transcription factor selected from:

- i) a transcription factor having the amino acid sequence of SEQ ID NO: 6; and
- ii) a transcription factor having an amino acid sequence that comprises at least amino acids 68-179 of SEQ ID NO: 6,

wherein the transcription factor enhances the biosynthesis in *Cantharanthus roseus* cells of at least one of tryptophane or tryptamine, when stably expressed in said *C. roseus* cells from a genetic construct comprising a sequence coding for the transcription factor operably linked to a plant promoter in a sense orientation.

100. (new) An isolated nucleic acid molecule comprising a nucleotide sequence selected from:

- a) SEQ ID NO: 3; and,
- b) a nucleotide sequence encoding an AP2-domain transcription factor selected from the group consisting of
  - i) SEQ ID NO: 6;
  - ii) a transcription factor comprising amino acids 68-203 of SEQ ID NO: 6; and
  - iii) a transcription factor comprising amino acids 1-179 of SEQ ID NO: 6.

101. (new) A method of increasing in a *Cantharanthus* plant cell the level(s) of expression of tryptamine or tryptophane, said method comprising the steps of:

a) transforming the cell with a genetic construct comprising a nucleotide sequence encoding an AP2-domain transcription factor, operably linked to an expression regulating sequence that is operable in said cell; and,

b) cultivating said cell under conditions such that the level of AP2-domain transcription factor is expressed in said cell;

wherein said nucleotide sequence encodes an AP2-domain transcription factor selected from:

i) a transcription factor having the amino acid sequence of SEQ ID NO: 6;

ii) a transcription factor comprising amino acids 68-203 of SEQ ID NO: 6; and

iii) a transcription factor comprising amino acids 1-179 of SEQ ID NO: 6,

wherein the transcription factor enhances the biosynthesis of at least one of tryptophane or tryptamine, when stably expressed in said cells from a genetic construct comprising a sequence coding for the transcription factor operably linked to a plant promoter in a sense orientation.

102. (new) The method according to claim 101, wherein the plant cell is *Cantharanthus roseus*.

103. (new) The method according to claim 99, wherein the plant cell is *Cantharanthus roseus*.